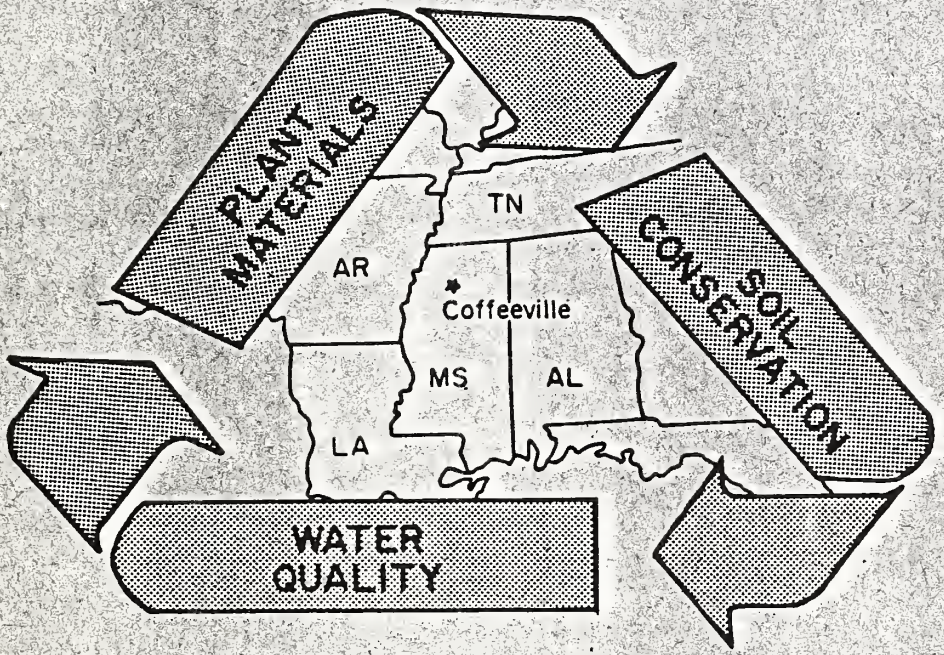
COFFEEVILLE PLANT MATERIALS CENTER

Coffeeville, Mississippi

Report of Activities – 1989

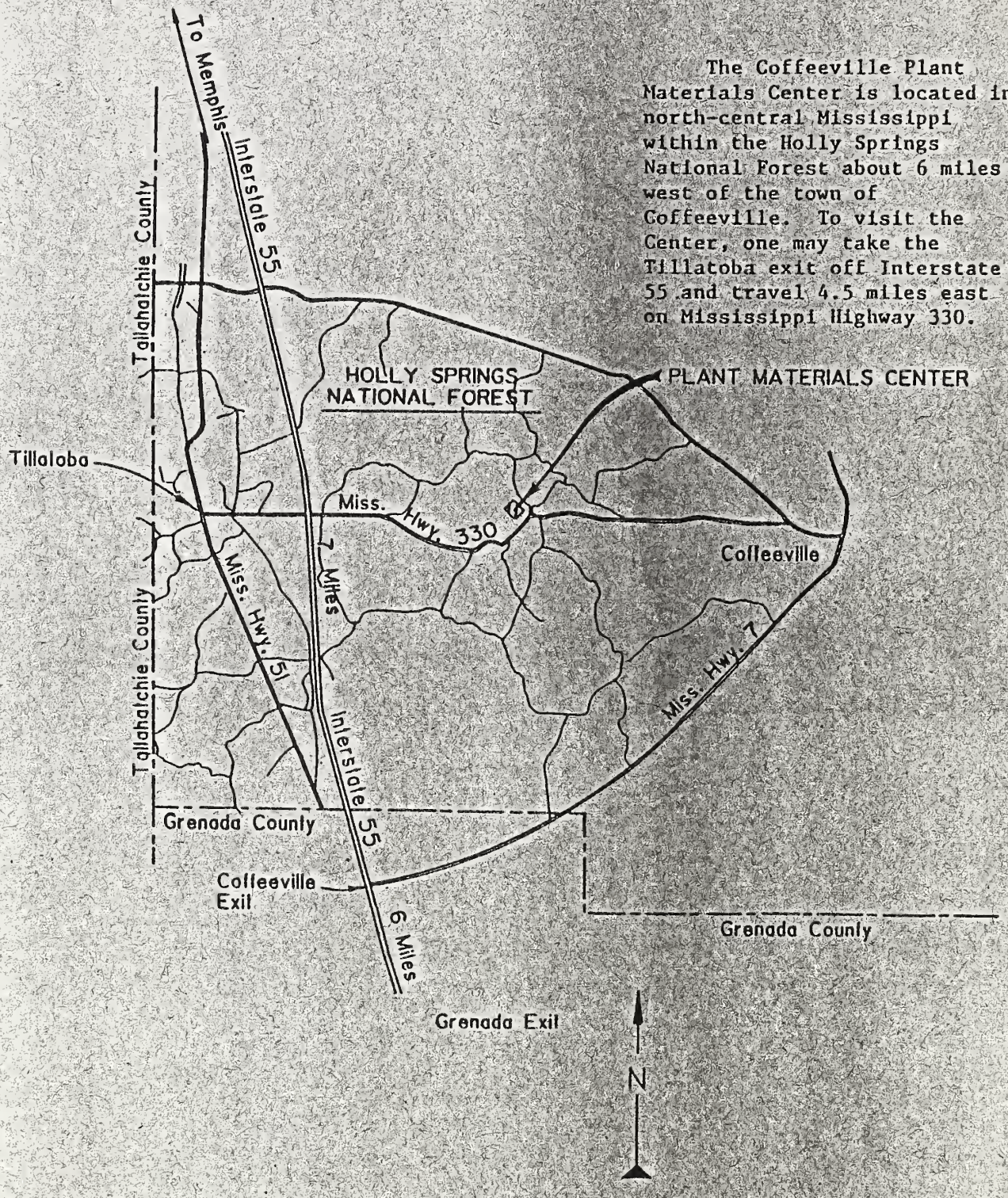


United States Department of Agriculture

Soil Conservation Service

Location

The Coffeeville Plant Materials Center is located in north-central Mississippi within the Holly Springs National Forest about 6 miles west of the town of Coffeeville. To visit the Center, one may take the Tillatoba exit off Interstate 55 and travel 4.5 miles east on Mississippi Highway 330.



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INTRODUCTION

The Coffeeville Plant Materials Center (PMC) is part of a network of 26 centers operated by the Soil Conservation Service (SCS). The National Plant Materials Program began soon after the SCS was founded because the need to have better plants was recognized at that time. The purpose of the Plant Materials Program is to select improved plant cultivars and develop better methods for the prevention of soil erosion using plants. When cultivars are shown to be superior, they are released to the public for commercial production. Since the program was started, about 300 varieties of superior plants have been released. Many of these are well adapted to the South. The most outstanding of these is probably 'Pensacola' bahiagrass.

The Coffeeville PMC began as part of the much larger Flood Prevention Seed Unit on August 8, 1960. In 1982, the Seed Unit was discontinued and plant materials activities were reorganized and expanded. Throughout its history, the Coffeeville PMC has evaluated over 6,000 plants. A number of these were determined to be superior conservation plants and were later released, not only by Coffeeville but by other PMCs and experiment stations. To date, the Coffeeville PMC has been a participant in the release of seven cultivars as follows:

'Quail Haven' reseeding soybean for wildlife.

'Ellagood' autumn olive for wildlife.

'Gobbler' sawtooth oak for wildlife.

'Meechee' arrowleaf clover for forage.

'Chiwapa' Japanese millet for wildlife.

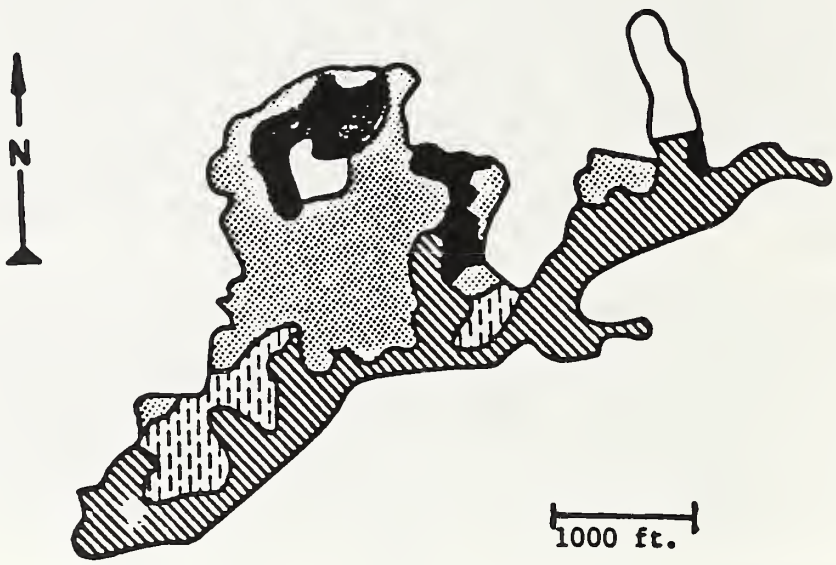
'Halifax' maidencane for stream channels and shorelines.

'Wilmington' bahiagrass for improved pasture.

SOILS

Most work at the PMC is conducted in the nearly level bottom land on Oaklimeter silt loam. These soils are naturally very acid and wet, but they can be very productive with proper water control and drainage. Loring and Grenada silt loams with fragipans dominate the slopes.

SOIL SERIES



LEGEND

- Grenada
- Loring
- Oaklimeter
- Smithdale
- Water

WEATHER

The mild winter that started in 1988 continued into 1989. January was more like March as temperatures averaged 10 degrees above normal and precipitation exceeded 8 inches. Similar weather continued into February and the PMC fields were saturated.

In March, the fields were getting dry and green. Then prospects for an early spring were shattered by a late frost on April 11 when many of the young and tender plants were killed. This last freeze of the year, coming about a month later than normal, has aptly been referred to as a "second April Fool's Day."

Frequent, heavy rains returned in May and continued through June. Temperatures were lower than normal due to the overcast conditions, but rainfall was about twice as much as normal. The fields began to dry in August, and the weather settled into its normal pattern until December.

This time it was December, not March, that "came in like a lamb and went out like a lion." Freezing temperatures were recorded on 23 days, but the most ugly weather was reserved for the holiday season. Temperatures of 0° to -3°F were recorded the nights of December 21, 22, and 23. The north wind constantly blew, and wind chill factors of -25° to -30°F were common. The ground froze, and many plants were killed or damaged since they had not yet become acclimated to weather so cold.

TABLE 1. TEMPERATURE AND PRECIPITATION AT COFFEEVILLE PLANT MATERIALS CENTER

Weather Summary for 1989

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Temperature (°F)														
Extreme 1989	High	74	67	74	86	91	92	96	96	96	87	80	60	96
	Low	27	16	27	30	48	62	70	68	62	31	28	-3	-3
Average 1989	High	51	45	59	70	75	83	91	90	81	70	59	40	68
	Low	40	32	46	54	60	70	74	74	68	53	43	25	53
Average 1975-1989	High	45	51	61	71	78	87	91	89	84	71	60	50	69.8
	Low	29	34	43	51	61	69	73	72	65	51	42	33	51.9
Precipitation (in.)														
Total 1989		8.13	8.33	3.34	2.85	9.61	11.17	12.19	3.39	4.03	2.36	5.35	3.45	74.17
Average 1975 - 1989		4.31	4.54	6.19	4.93	6.27	5.06	4.46	3.20	4.48	4.07	6.76	5.15	59.44

SERVICE AREA

The primary service area for the Coffeeville PMC was again changed in 1989 for the third time since 1983. This time significant portions of Arkansas and Louisiana were ceded to recently established PMCs in Booneville, Arkansas; Golden Meadow, Louisiana; and Nacogdoches, Texas. To compensate for the loss, MLRA (major land resource area) 133A in Mississippi was added to the Coffeeville service area. The present PMC service area now covers most of Mississippi and significant areas of Alabama, Arkansas, Louisiana, and Tennessee. The present service area is shown on the following page.

Throughout the service area, the climate is humid and temperate. Rainfall is approximately 50 inches for most of the area. Droughts in late summer and autumn are common. Temperature increases from north to south. Summer temperatures of 90° to over 100°F are commonly accompanied by high humidity. Winters are mild in the southern part. Snowfall accumulations are common only in the north. Soil, vegetation, topography, and land usage are closely related to the MLRA.

LONG RANGE PROGRAM

Conservation problems for the PMC service area are identified in the PMC Long Range Program. Once the priorities have been established by the State Conservationists' Advisory Committee, the PMC develops project plans to solve the problems given the highest priority. Some plants or techniques may be applied to solve several problems, but the projects listed below are under the one category where the expected benefit will be the greatest.

Projects being conducted by the PMC for each of the problem areas in 1989 were as follows:

CROPLAND EROSION — Priority: HIGH

28I111M Evaluation of Cool Season Accessions for use with No-Till or Conservation Tillage Systems.

28I115M Selection of a Cultivar of Rescue Grass (Bromus unioloides) for Winter Cover.

28A123E Selection of a Cultivar of Vetiver Grass (Vetiveria zizanioides) for Soil and Water Conservation.

28A801M Interseeding Common Row crops in Selected Plant Materials.

U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

LEGEND

STATE BOUNDARY

PMC SERVICE AREA BOUNDARY

MAJOR LAND RESOURCE AREAS

O — MISSISSIPPI DELTA COTTON AND FEED GRAINS

131 — Southern Mississippi Valley Alluvium

P — S. ATLANTIC AND GULF SLOPE CASH CROPS, FOREST AND LIVESTOCK

134 — Southern Mississippi Valley Silty Uplands

133A — Southern Coastal Plain

135 — Alabama, Mississippi and Arkansas Blackland Prairie

COFFEEVILLE PLANT MATERIALS CENTER SERVICE AREA

0 100 200 MILES

SOURCE:
PLANT MATERIALS CENTER BOUNDARY DERIVED BY SCS FIELD TECHNICIANS.
DIGITIZED FROM SCS BASE 1000303–05 DATED SEPTEMBER 1988.
MAP COMPILED USING AUTOMATED MAP CONSTRUCTION WITH THE
FOCAS EQUIPMENT. NATIONAL CARTOGRAPHIC CENTER
FORT WORTH, TEXAS 1989.

NOVEMBER 1989 1005100

USDA SCS-NATIONAL CARTOGRAPHIC CENTER, FT. WORTH, TX 1989

PASTURE AND RANGELAND EROSION — Priority: MEDIUM

28I103B Assembly and Initial Evaluation of Purpletop (Tridens flavus).

28I110G Assembly and Initial Evaluation of Cold Hardy Bahiagrass (Paspalum notatun).

WOODLAND EROSION — Priority: MEDIUM

28I105B Initial Evaluation of Upright, Perennial Lespedezas (Lespedeza spp.).

CRITICAL AREA EROSION — Priority: MEDIUM

28I104D Assembly and Initial Evaluation of Beaked Panicgrass (Panicum anceps).

28I106B Initial Evaluation of Trailing Wild Bean (Strophostyles spp.)

28I107B Initial Evaluation of Sensitive Plant (Mimosa strigillosa).

28I110M Initial Evaluation of Heat Tolerant Crownvetch (Coronilla varia).

28A101D Plan for Release of a Superior Variety of Partridge Pea.

28A282E Plan for Selection of a Superior Variety of Giant Reed.

28A482E Plan for Release of a Superior Willow for Stream Channel and Shoreline Erosion Control.

WATER QUALITY DETERIORATION — Priority: HIGH

28A182E Plan for Release of Afghan Reedgrass.

Because of increased concern over the deterioration of water quality in the service area and throughout the nation, the water quality issue was included as a PMC responsibility in 1989.

MAJOR PROJECTS IN 1989

Problems in the PMC Long Range Program are too complex to solve in one simple operation so they are broken into a set of simpler components. Then the PMC Manager, in consultation with appropriate technical specialists, develops project plans designed to solve one segment of the problem. The projects are designed (1) to develop improved methods to use plant materials, or (2) to select and release improved cultivars for conservation purposes.

PROJECTS TO DEVELOP IMPROVED METHODS

The investigation of new methods to use conservation plants has been a part of the Coffeeville PMC operation throughout much of its history. In response to the Food Security Act of 1985, the PMC placed increased emphasis on developing better methods to solve erosion problems using plants. Much of this work involved developing no-till systems for common row crops, especially cotton.

Cover Crops for Cotton

In 1989, three experiments with cover crops for use with cotton were conducted at the PMC. These were to (1) evaluate the effects of soil applied herbicides on cover crops, (2) determine the best establishment method for no-till cotton, and (3) evaluate the effects of tillage and cover crops on cotton.

In the first study, fluometuron (Cotoran, Meturon), trifluralin (Treflan, Trilin), and norflurazon (Zorial) were evaluated for their effects on wheat, rye, crimson clover, and subclover. First year results indicated no reduction in percent ground cover following use of these herbicides (Table 2).

In the second test, no-till (NT), disking once (1X), chisel 1X, and paratill plowing methods were evaluated for establishing wheat, rye, crimson clover, and hairy vetch in NT cotton. Disking 1X tended to reduce percent ground cover but did not affect cover crop dry matter yield (Table 3); however, it did reduce cotton lint yield (Table 4). Cotton in rye plots showed symptons of nitrogen deficiency in late August and produced a lower seedcotton yield.

In the third study, cotton was grown by NT and conventional (CT) methods in crimson clover, hairy vetch, and wheat. Native cover (weeds) served as a check. NT cotton produced a higher seedcotton yield (1,905 lb/A) than CT (1,370 lb/A). Difference between yields between cover crops were not statistically significant (Table 5).

Table 2. Average ground cover (%) and dry matter yield (lb/A) for cover crops using soil applied herbicides, April 13, 1989 (Study 1).

Herbicide	Ground Cover	Dry Matter
Fluometuron	86	1,427
Norflurazon	88	1,540
Trifluralin	76	1,295
Check	76	1,568

Table 3. Ground cover and dry matter yield of cover crops by date as affected by establishment method, 1989 (Study 2).

Establishment Method	Ground Cover (%) 2/9	3/13	3/28	4/11	Dry Matter (lb/A) 4/13
No-Till	69	65 a	85 a	97	2,764
Paratill	66	63 ab	81 a	97	2,831
Disk 1X	60	55 b	70 b	94	2,650
Chisel 1X	68	59 ab	79 a	95	3,032

Table 4. Seedcotton yield (lb/A) as affected by tillage and cover crop at Coffeeville, MS, 1989 (Study 2).

Tillage System	Seedcotton Yield Crimson	Vetch	Rye	Wheat	Average
No-Till	1,864	1,972	1,784	1,668	1,822 A
Paratill	1,764	1,787	1,632	1,901	1,771 A
Disk 1X	1,436	1,498	1,330	1,480	1,436 B
Chisel 1X	1,497	1,906	1,301	1,730	1,608 AB
Average	1,640 bc	1,790 a	1,512 c	1,695 ab	1,659

Table 5. Seedcotton yields (lb/A) by NT and CT for four cover crops at Coffeeville, MS, 1989 (Study 3).

Cover Crop	Lint NT	CT	Seed NT	CT	Total NT	CT
Crimson Clover	586	552	998	940	1,584	1,492
Hairy Vetch	686	465	1,168	792	1,854	1,257
Wheat	786	482	1,339	821	2,125	1,303
Native	760	528	1,294	898	2,054	1,426
Average	705	507	1,200	863	1,905	1,370

Means not followed by a common letter are statistically different (DMRT, $P < 0.05$).

PROJECTS FOR RELEASE OF IMPROVED CULTIVARS

From start to finish, the release of an improved cultivar requires about 15 years of testing. The process is usually divided into a series of seven basic steps that are designed to determine the adaptiveness and performance of the plants and to ensure an adequate supply of materials.

Step 1: Assembly

After a project plan is developed and approved by the State Conservationists' Advisory Committee, the PMC starts to collect seeds or plants from many situations to compare at the PMC. Plant collections may come from a variety of sources, both foreign and native. At the PMC, each collection is given a unique accession number for identification throughout the testing program.

A large number of accessions is usually required to ensure that superior plants will be present. An assembly of more than 35 collections is called a major assembly. Many major assemblies have more than 100 collections.

In 1988 a schedule to initiate assemblies was developed to distribute the workload evenly over a number of years. The schedule was approved by the State Conservationists' Advisory Committee subject to annual review, as are all PMC activities. The schedule for assembly is as follows:

1988	Winter rye (*Secale cereale*) for cover crop.
1988	Dwarf wheat (*Triticum aestivum*) for no-till.
1989	Annual bluegrass (*Poa annua*) for no-till cotton.
1989	Rescuegrass (*Bromus unioloides*) for winter cover.
1990	Sour clover (*Melilotus indica*) for winter cover.
1990	Mustard (Cruciferae) for winter cover.
1990	Eastern gamagrass (*Tripsacum dactyloides*) for forage.
1991	Henbit (*Lamium amplexicaule*) for no-till.
1991	Chickweed (Caryophyllaceae) for no-till.
1991	Wild geranium (*Geranium* sp.) for no-till.
1991	Wood-sorrel (*Oxalis* sp.) for no-till.
1992	Low panicums (*Dicanthelium* spp.) for critical areas.
1993	Vasey grass (*Paspalum urvillei*) for warm-season forage.

All species to be assembled through 1989 have been collected. The number of collections of annual bluegrass was inadequate in light of its wide distribution, and more accessions are to be collected in 1990.

Step 2: Initial Evaluation (IE)

After the seeds or plants arrive at the PMC and are given an accession number, they are planted in rows or small plots. Accessions in each assembly are planted in groups so an easier and more meaningful comparison can be made. Periodically, PMC personnel evaluate the plants for vigor; seed production, resistance to diseases and insects; and tolerance to heat, drought, and cold. Also, the plants are measured and dates of flowering and maturity recorded. At the end of this step, a few of the best accessions are selected for advanced evaluation.

New IE Projects

Vetiver grass (Vetiveria zizanioides) for soil and water protection.

Perhaps no other conservation plant has received so much praise in recent years. This perennial, warm season grass has been used to control erosion for years in its native India, and the World Bank is promoting its use in underdeveloped countries throughout the tropics. Vetiver grass grows in dense clumps and has a deep, vertical root system. It can be planted 6 to 8 inches apart in single rows to produce "living terraces" which manipulate water runoff and greatly reduce erosion on sloping cropland. It does not spread from the row and interfere with crop growth.

Because of keen interest in this "miracle grass," a conference was held at Griffin, Georgia, in August to make plans to test it in the United States. It called for joint testing by the SCS, Agricultural Research Service (ARS), and land-grant universities in the "Deep South." The Coffeeville PMC was given a prominent role in the project.

A search for available plant materials only yielded five accessions. Four were obtained from the ARS Plant Introduction Station (S-9) at Griffin, Georgia, and one other was obtained from Mr. Eugene LeBlanc of Sunshine, Louisiana. These were planted in April, and all made good growth and produced very dense clumps 6 to 8 inches in diameter by fall.

Other IE Projects

Rescuegrass was the only other initial evaluation to be planted in 1989. Assemblies of 100 accessions of winter rye and wheat respectively were obtained from the National Small Grain Laboratory (NSGL), but they were not planted because they were received too late for an early fall planting. The rye and wheat are scheduled to be planted in the fall of 1990.

Furthermore, initial evaluations continued for the following:

Sensitive plant (Mimosa strigillosa) for cropland erosion control and critical area stabilization.

Bahiagrass (Paspalum notatum), cold-tolerant, for improved pasture.

Crownvetch (Coronilla varia), heat-tolerant, for critical area stabilization.

Lespedezas (Lespedeza sp.), upright natives, for erosion control in forests and field borders.

Trailing wild bean (Strophostyles sp.) for erosion control in forests and field borders.

Completed IE Projects

Purpletop (*Tridens flavus*)

During the spring of 1983, 144 accessions of purpletop were planted to be evaluated for critical area stabilization and rangeland improvement. In 1989, three accessions were selected as being superior in overall vigor, leafiness, seed production, and disease resistance. These accessions are:

9002937 and 9041780, both of which are experimental lines from the Quicksand (KY) PMC.

9028270 collected in Yell County, Arkansas, by C. G. Fleischman.

Beaked Panicgrass (*Panicum anceps*)

In 1984, 91 accessions were planted to be evaluated for critical area erosion control and rangeland improvement. Three accessions were selected in 1989 as being superior in overall vigor, leafiness, seed production, and disease resistance. These accessions are:

9002928 collected in Virginia and received from the Quicksand PMC.

9028349 collected in Jefferson County, Arkansas, by A. G. Mendenhall.

9028510 collected in Wayne County, Mississippi, by James A. Wolfe.

These accessions of purpletop and beaked panicgrass will be put into initial increase at the Coffeeville PMC. Further testing over a broader area is planned, and the release of a superior cultivar for the eastern United States is anticipated. The Coffeeville PMC is working jointly with PMCs at Booneville, Arkansas, and Quicksand, Kentucky, to release these cultivars.

Step 3: Initial or Small Scale Increase

When an initial evaluation has been completed and accessions with superior qualities have been selected, they are increased in small plots to provide material for additional testing. In 1988, initial increases were begun for the accessions of trailing wild bean that were considered to have release potential. These were in addition to partridgepeas and other accessions already in advanced evaluations.

Step 4: Advanced Testing

When sufficient material has been increased, the accessions selected as superior in initial evaluations are tested for ability to solve one or more conservation problems in the PMC Long Range Program. The selected accessions are compared with standard plants that are currently considered the best to solve the problem.

Advanced testing often includes off-center plantings to test plants where soil or other conditions strongly contrast with those at the center. These are conducted as a part of the PMC program or in conjunction with other plant materials activities.

In 1989, advanced evaluations continued for giant reed (Arundo donax). One accession, PI-432432, that was considered to be the best of four at the Coffeeville PMC, was being compared to five superior selections from the Brooksville (FL) PMC in a cooperative project.

Step 5: Field or Large Scale Increase

Accessions that are candidates for release are grown in large quantities for the final stages of evaluation. Some of the material continues to be used in advanced evaluations but much is destined for field plantings.

Vetiver grass (Vetiveria zizanioides) was the only new accession to be increased on a large scale at the PMC in 1989. Vetiver grass was first brought to the United States by the perfume industry in the 19th century, and scattered stands remain in Louisiana and Texas. In 1989, about 2,000 slips of accession 9054943 were obtained from Sunshine, Louisiana, and planted in March. A late freeze on April 11 killed top growth, but the plants quickly recovered. By fall, each slip of 2 or 3 shoots had increased into a dense clump up to 8 inches in diameter, an increase of 10-20 fold over the original planting stock. This increase was intended to produce material for further testing of this species.

Step 6: Field Plantings

The last step in evaluating a candidate for release by a PMC is the field planting. In field plantings, the test plant is compared to standards (best plants currently available for that purpose) in actual field situations. At this point, the test plants are still in the experimental stage and are not to be harvested and sold before they are formally released.

Candidates for release at the Coffeeville PMC being tested in field plantings in 1989 were:

Afghan reedgrass (Calamagrostis pseudophragmites, PI-220584)
Goat willow (Salix caprea, PI-434284)
Gilg willow (Salix gilgiana, 9004882)
Erect willow (Salix rigida, 9004885)
Prairie willow (Salix humilis, 9004886)

Step 7: Cultivar Release and Use

When data from all of the previous steps have been assembled, they are presented to the cooperating agencies and release committee. If they agree that the plant is superior, the plant is cooperatively named and released for commercial production and use. The Coffeeville PMC has responsibility for maintaining breeder and foundation blocks of its releases and does not supply plant material to the general public. It only maintains small "foundation" blocks to provide genetically pure stock to qualified growers who supply the public.

MATERIALS AVAILABLE FOR COMMERCIAL INCREASE

Information about commercial production of SCS released cultivars may be obtained through any office of the SCS. Releases from the Coffeeville PMC that are available are:

'QUAIL HAVEN' RESEEDING SOYBEAN

This plant was released for wildlife in 1986. It is a vining annual legume that produces an abundance of small seed that are eaten by quail and dove. It has many hard seed that remain on the soil throughout the winter and germinate the following spring. The plants may also be used for hay and as summer cover for soil improvement.

'MEECHEE' ARROWLEAF CLOVER

This is an annual legume that is a high producer of quality forage in spring and early summer. It may also be used as a cool-season cover crop.

'CHIWAPA' JAPANESE MILLET

This plant was released for wetland wildlife by the Coffeeville PMC because of its ability to withstand flooding. It may be sowed on mud flats in the summer and flooded to provide food for waterfowl. It also produces an abundance of foliage that can be utilized by livestock.

'HALIFAX' MAIDENCANE

This grass does not produce seed so it is established from coarse rhizomes. It is an excellent plant for stabilization of stream and lake banks.

Seed of all of the above except 'Halifax' maidencane are available for certified seed production from:

Foundation Seed Stock
Mississippi State University
P. O. Box 5267
Mississippi State, MS 39762

Those interested in production of 'Halifax' maidencane or other SCS releases may also contact:

Plant Materials Specialist
Soil Conservation Service
Suite 1321, Federal Building
100 West Capitol Street
Jackson, MS 39269

FIELD ACTIVITIES IN ARKANSAS, LOUISIANA, AND MISSISSIPPI

COTTON FIELD TRIALS

In addition to no-till cotton studies at the Coffeeville PMC, field trials were also established in Mississippi and Louisiana as field-size demonstrations. Design of the trials was left to the discretion of each state, but they agreed to work together and share information.

Five Individual Trials in Mississippi

For the second year of the planned project, NT cotton was planted at five locations in Mississippi. One cover crop (arrowleaf clover, crimson clover, hairy vetch, native cover, and wheat) was grown at each location. The objective of the project was to refine methods of reducing soil erosion by investigating the impact of reduced tillage and cover crops on cotton producing systems.

In Mississippi, NT cotton yields were equal to or higher than CT cotton. The one low yield with crimson clover was due to replanting the cotton in late May because of cold, wet weather in early May. Hairy vetch was slow to establish but provided almost complete cover at herbicide burndown. Freezing temperatures either killed or reduced growth of the clovers due to late planting dates (mid-November to early December). Results for 1989 are shown in Tables 6 and 7.

Table 6. Canopy cover and dry matter yield for five cover crop types in NT cotton field trials in Mississippi, 1989.

Cover Crop	Canopy Cover (%) Feb.	Mar.	Apr.	Dry Matter (lb/A) April
Arrowleaf Clover	-	-	-	-
Crimson Clover	12	14	30	200
Hairy Vetch	27	42	95	1,076
Wheat	81	78	98	3,056
Native (Weeds)	83	71	97	679

Table 7. Comparison of lint yield (lb/A) for NT and conventional cotton grown with five cover crops in Mississippi, 1988-1989.

Cover Crop	No-Till 1988	No-Till 1989	Conventional 1988	Conventional 1989
Arrowleaf Clover	520	630	672	614
Crimson Clover	450	595	875	900
Hairy Vetch	717	889	750	870
Wheat	241	553	441	650
Native (Weeds)	946	1,100	1,078	882

Replicated Trials in Louisiana

The SCS in Louisiana developed a cooperative field-size demonstration with the Agricultural Experiment Station and Cooperative Extension Service. A cotton field near Winnsboro was selected and the field was divided into 12 plots of 6 treatments and 2 replications. In 1989, NT cotton produced the highest lint yield though not significantly different from CT cotton. Cotton in vetch had to be replanted due to low soil moisture; however, no differences were found due to the delayed planting. Results for the second year study are shown in Table 8.

Table 8. Yields for cover crop dry mattter (DM) and cotton grown different tillage systems at Winnsboro, Louisiana, 1989.

Tillage System	Cover Crop	Cover Crop DM (lb/A)	Cotton Yield Lint (lb/A)
Ridge Till	None	400	664
No-Till	Vetch	1173	677
No-Till	Wheat	1244	758
No-Till	None	357	783
Conventional	Vetch	1451	676
Conventional	None	455	706

SURFACE MINE RECLAMATION IN ARKANSAS

In addition to plantings begun earlier to test various plants for surface mine reclamation in Mississippi and Louisiana, a series of mine plantings have been made by the Booneville PMC in Arkansas. The first plantings, consisting of 28 cool season forage grasses and legumes, were planted in the fall of 1988 in Sebastian and Pope Counties. An additional 38 warm season species were added in 1989. No reports have yet been issued for these studies.

The objectives of the Arkansas project are to:

1) Evaluate plants of known forage potential for adaptation to typical mine sites.

2) Evaluate forage production for mixtures and determine their persistence under grazing.

3) Evaluate herbaceous plants for erosion control and wildlife use.

4) Determine the species of trees and horticultural variety to use.

5) Determine the most economical method to establish adequate vegetation.

6) Implement the transfer of technology to the appropriate users.

NEW PMC IN LOUISIANA

On April 22, 1989, the Golden Meadow Plant Materials Laboratory became the 26th SCS PMC. It was originally established to evaluate plant materials for erosion control in coastal areas in Louisiana where 40 to 50 square miles of marsh were being lost to erosion each year. Since the coastal area of Louisiana was in the service area of the Brooksville PMC in Florida, the laboratory was established under the direction of Robert Glennon, manager at Brooksville. The site selected for the laboratory was in Lafourche Parish south of New Orleans on 54 acres made available by the Louisiana Land and Exploration Company. Mr. Glennon was instrumental in obtaining plant collections from every coastal county from North Carolina to Texas for the new laboratory. First assemblies were smooth cordgrass (Spartina alternifolia) and giant cutgrass (Zizaniopsis miliacea).

In 1988, plans were made to change the laboratory to the Golden Meadow PMC with Tommy Biles as manager. Michael J. Materne was designated to provide technical guidance for the new center and be Plant Materials Specialist for Louisiana with headquarters on the Louisiana State University (LSU) campus in Baton Rouge. With greenhouse and laboratory space provided at LSU, Mr. Materne has been able to incorporate modern biotechnology into the traditional plant materials program.

At its dedication, the Golden Meadow PMC celebrated its opening with the release of 'Vermilion' smooth cordgrass for coastal shoreline erosion control. Smooth cordgrass, while being extremely salt tolerant, can be grown in fresh water situations and has great potential for stabilizing lake banks and shorelines. Recently the number of species being evaluated at the PMC has been expanded by the addition of assemblies of Gulf cordgrass (Spartina spartinae) and black mangrove (Avicennia nitida).

WATER QUALITY IN MISSISSIPPI

Capitalizing on space-age technology pioneered by Dr. B. C. Wolverton at the Stennis Space Center at Bay St. Louis, Mississippi, the SCS has initiated trials to treat animal wastes using constructed wetlands in Mississippi. At the Coastal Plains Experiment Station at Newton, scientists and engineers from the SCS and Mississippi State University have constructed a series of ponds to test the effectiveness of cattail (Typha latifolia), bulrush (Scirpus validus), canna (Canna flaccida), maidencane (Panicum hemitomon), pickrelweed (Pontederia cordata), and arrowhead (Sagittaria latifolia) in treatment of wastes from a diary herd.

Also plant materials are being used for water quality improvement on the farm of Truman Roberts near Hattiesburg. Mr. Roberts has installed artificial wetlands using maidencane and torpedograss (Panicum repens) in his catfish operation to increase production and reduce cost. He has been able to double the density of catfish in a four-acre pond by using an adjoining one acre marsh. By recycling the water he is able to use only surface runoff from his land and conserve ground water. He estimates that his water only costs about $160 per month compared to $4,200 if he had to replace polluted water in his ponds with ground water.

FIELD PLANTINGS

Field plantings are made to gather information on candidates for release from PMCs. After release they may be made to gather more information when their range of adaptation is not clearly known.

Prior to field planting, a long range plan is prepared for the orderly testing of the promising plant. The plantings are usually scheduled over a number of years in a variety of soil and climatic conditions, if possible. Field plantings are coordinated by Plant Materials Specialists who generally serve more than one state, and each state may test plants from several PMCs. The test sites are provided by conservation district cooperators, mining companies, local governments, and others. The plantings and evaluations are usually conducted through SCS field offices.

No new long range plans for field plantings were implemented in 1989. Evaluations continued for those previously listed in the 1987 Annual Report. Eleven of the older field plantings were completed or terminated in 1989. These field plantings were:

American jointvetch (Aeschynomene americana, PI-421680)
Afghan reedgrass (Calamagrostis pseudophragmites, PI-220584)
Illinois bundleflower (Desmanthus illinoensis, 'Sabine')
Englemanndaisy (Englemannia pinnatifida, 'Eldorado')
Sericea lespedeza (Lespedeza cuneata, 'Okinawa')
Switchgrass (Panicum virgatum, 'Alamo')
Goat willow (Salix caprea, PI-434284)
Gilg willow (S. gilgiana, 9004882)
Prairie willow (S. humilis, 9004886)
Erect willow (S. rigida, 9004885)
Teosinte (Zea mexicana, PI-422162).

Data for the completed projects are scheduled to be analyzed in 1990 and the results given in technical papers, if justified. The results will be summarized in this report in 1991.

TECHNICAL PAPERS WRITTEN IN 1989

Coffeeville Plant Materials Center. Technical Notes. No. 1.
Initial Evaluation of Trailing Wildbean.

Copies of this and other reports may be obtained from:

Coffeeville Plant Materials Center
Route 3, Box 215A
Coffeeville, MS 38922

or

Plant Materials Specialist
Soil Conservation Service
Suite 1321, Federal Building
100 West Capitol Street
Jackson, MS 39269

COFFEEVILLE PLANT MATERIALS CENTER

COFFEEVILLE, MISSISSIPPI

Report of Activities -- 1989

Including Field Activities in Arkansas, Louisiana, and Mississippi

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